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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04M	A2	(11) International Publication Number: WO 99/25106 (43) International Publication Date: 20 May 1999 (20.05.99)
(21) International Application Number: PCT/US98/22780 (22) International Filing Date: 27 October 1998 (27.10.98) (30) Priority Data: 08/967,476 11 November 1997 (11.11.97) US (71) Applicant: AT & T CORPORATION [US/US]; 32 Avenue of the Americas, New York, NY 10013-2412 (US). (72) Inventor: GREENSPAN, Steven, L.; 1566 Ramapo Way, Scotch Plains, NJ 07076 (US). (74) Agents: DWORETSKY, Samuel, H. et al.; AT & T Corp., P.O. Box 4110, Middletown, NJ 07748 (US).		(81) Designated States: CA, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: METHOD AND APPARATUS FOR PROVIDING PREPAID TELEPHONE SERVICE OVER A COMPUTER NETWORK (57) Abstract An on-line prepaid calling card purchasing and monitoring system and billing method for prepaid calling cards. The on-line system is accessible over computer networks such as the Internet. Customer can purchase new calling card, monitor existing calling cards, and increase the account balance over the computer network. The prepaid calls can be initiated in a variety of ways including dial-around, assigned telephone, and on-line configuration.		

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**METHOD AND APPARATUS FOR PROVIDING PREPAID
TELEPHONE SERVICE OVER A COMPUTER NETWORK**

5

FIELD OF THE INVENTION

The present invention relates generally to providing prepaid telephone calling cards on demand,
10 and more particularly, to providing alternative prepaid billing methods.

BACKGROUND OF THE INVENTION

Prepaid telephone calling cards allow telephone
15 users to bill charges for telephone calls to a prepaid account instead of the telephone account associated with the originating telephone. However, the amount remaining on a prepaid telephone calling card is often unknown to the user. Thus, it is desirable for the
20 owner of the prepaid telephone calling card to be able to monitor the remaining balance on the card.

The balance on some prepaid calling card accounts can be increased by writing or telephoning a calling card company and specifying the amount and the billing
25 information.

Prepaid calling cards can be purchased over the Internet. For example at the Internet address:

[HTTP://www.att.com/prepaidcard/cardstore](http://www.att.com/prepaidcard/cardstore)

Internet users can purchase prepaid calling cards.

30 However, current account balance is not available.

Currently, prepaid calling cards require dialing an access number such as a "1-800" number and a personal identification number in addition to the desired called telephone number. This method is
5 cumbersome, requiring entry of numerous digits for every telephone call. A recognized problem, therefore, is the excessive number of digits required to initiate a prepaid telephone call, especially when multiple calls originate from the same billable
10 telephone number.

SUMMARY OF THE INVENTION

The aforementioned problems are solved by
15 providing users access to requesting, updating, and retrieving status on prepaid telephone calling card over a computer network and providing alternative dialing methods.

20

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a system diagram illustrating an embodiment of a prepaid telephone calling card accounting system;

25 Figure 2 is a flow diagram illustrating an embodiment of a prepaid telephone calling card accounting system;

Figure 3 is a flow diagram illustrating the prepaid telephone calling card accounting system in
30 use.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figure 1, the prepaid calling card system 10 includes one or more computer terminals 12 for processing requests and receiving responses, one or more computer networks 14 connected to the computer terminals 12, and one or more calling card account server ("CCAS") connected to the computer network 14. The CCAS being connected to one or more telephone billing systems 20. The telephone billing system 20 being connected to a telephone network 22. The telephone network 22 is connected to a plurality of telephones 24 for making telephone calls.

The computer terminals 12 can be any computer network compatible device including a personal computer, a display terminal, a laptop computer, a palmtop computer, a workstation, a mainframe computer, or another network compatible device.

The computer network 14 transmits messages in a computer network protocol between the CCAS 18 and the computer terminals 12. It is a preferred embodiment of the present invention that the computer network 14 include the Internet.

A preferred embodiment of the invention includes encrypted communication between the customer's computer terminal 12 and the CCAS 18. Additionally, the CCAS 18 and the telephone billing system 20 can be co-located or the communication can be encrypted to protect the communication.

The computer network 14 can be a private computer system such as an intra-company or campus computer system. Also, the computer system can encompass a

global computer system including the Internet or combinations of varying networks.

The CCAS 18 is a computer network compatible device can be any computer network compatible device including a personal computer, a display terminal, a laptop computer, a palmtop computer, a workstation, a mainframe computer, or other network compatible device.

Telephones 24 used to make and receive calls are connected together through a telephone network 22. The telephone network is connected to a telephone billing system 20 that contains telephone customer information including billing information. A preferred embodiment includes an intra-company or intra-campus telephone network.

For example, an employee's assigned work telephone number could be associated with a prepaid calling card account so that all toll calls over the intra-company network are charged to the prepaid calling card account. Likewise, toll calls from telephone numbers assigned to students in a campus wide telephone and computer network are bill to prepaid calling card accounts associated with the calling (billable) telephone number. A billable telephone number is a telephone number permitted charge calls to an account, in contrast to a pay phone or a limited use telephone such as a local call only phone.

The CCAS 18 is linked directly or through a computer network (not shown) to the telephone billing system 20. The telephone billing system 20 monitors accounting information concerning calls made over the

telephone network 22. The calls include at least prepaid calling card calls, however, it can monitor all calls made over the telephone network 22. The telephone network 22 contains a plurality of
5 telephones 24 for communicating over the telephone network 22. The telephone 24 includes commercial and residential telephones, fax, computer and other non-voice communication devices, cellular phones, and pay phones.

10 Referring to Figure 2, a user at a computer terminal 12 (Figure 1) enters 30 a request to a calling card account server ("CCAS") 18 (Figure 1). The computer terminal 12 generates 32 a request message and transmits it to the CCAS. The request
15 message includes the transaction information such as a credit card account to be charged or credited, the user name and address, and the date.

The CCAS evaluates 34 the request and validates any transaction information. For example, the request
20 can be handled by a standard credit card validation service used to validate credit card charges. The CCAS 18 transmits 36 a response to the computer terminal 12. Optionally, the user can print 38 the calling card information or receive a physical card by
25 mail.

The prepaid calling card can provide telephone service based on an amount telephone usage time, an amount of cost per calling time, or an amount of calls initiated.

30 The request can be for a new account, account balance information or activity information. A request for a new account can include transaction

information. Transaction information includes such information as credit card number and expiration date, requester's name, address, called-from number to be associated with the prepaid calling card number,

5 requester's name, and requester's personal identification number if applicable.

Requests for account balance information includes requests for a new calling card, requests for a increase in the account balance, requests for account
10 balance information, requests for refund of account balance, and requests for transferring account balance between active calling cards. These requests optionally include a validation code that confirms the requester is the owner of the prepaid account.

15 Request for activity information include request for recent activity, request for complete activity history, and request for calling restrictions. These requests optionally include a validation code that confirms the requester is the owner of the prepaid
20 account.

For example, a user at a computer terminal 12 (Figure 1) enters a request for a prepaid calling card. The computer terminal 12 transmits the request message to the CCAS 18 through the computer network
25 14. The request message contains at least desired value and payment information. The CCAS 18 evaluates the request to ensure sufficient information is contained in it. The CCAS validates the information in the request message. After processing the request,
30 the CCAS 18 transmits a response message to the computer terminal 12. The response message contains

either a notification that the request was not approved or the prepaid calling card number.

Subsequent to receiving a prepaid calling card number, the user at a computer terminal 12 can
5 transmit a request for information concerning the particular prepaid calling card number. Also, the amount remaining on the prepaid calling card can be increased by transmitting an appropriate request message from a computer terminal 12.

10 Response messages can be generated automatically and sent to a designated electronic mail address. Such automatic messages could occur periodically (e.g. monthly), when the amount remaining reached designated thresholds (e.g. every \$5), or after unusual activity
15 (e.g. non-use, excessive use, unusual use).

Referring to Figure 3, a user initiates 40 a telephone call specifying the prepaid calling card. The telephone connection is made 42 either through a telephone network 22 (Figure 1) or a computer network
20 14 (Figure 1).

Before the call is connected, the current account balance of the prepaid calling account is validated to determine if sufficient fund exist. Optionally, account balance can be periodically validated during a
25 call to determine if the account balance is adequate to continue the call. Also, the user can be warned as the balance reaches a determined level. For example, an audible warning can indicate that only one minute remains on the prepaid account.

30 The information concerning the telephone call is sent 44 to the telephone billing system 20 (Figure 1) where the bill is calculated. Because the prepaid

calling card was specified, the telephone billing system 20 (Figure 1) transmits 46 the information to a calling card account server 18 (Figure 1). The calling card account server 18 processes 48 the transaction information and updates the calling card accounts accordingly.

Embodiments of the current invention allows telephone calls to be initiated in a variety of manners and charged to a prepaid calling card account. First, a user can directly dial the desired number from a predesignated telephone 24, for example the user's home or business telephone. Toll calls are deducted automatically from the prepaid calling card rather than billing a telephone account.

Second, the user can dial a prefix such as "10-xxx", where xxx represents any three numeric digit combination. For example, "10-123" or "10-555." The prepaid calling card associated with the called-from number is then charged for the call.

Third, the user can initiate a telephone call over the computer network 14 from a computer terminal 12. The prepaid calling card information can be entered manually or automatically from a predefined configuration profile in the computer terminal 12. The call is charged to the prepaid calling card.

While preferred embodiments have been shown and described, it will be understood that they are not intended to limit the disclosure, but rather it is intended to cover all modifications and alternative methods and apparatuses falling within the spirit and scope of the invention as defined in the appended claims or their equivalents.

WHAT IS CLAIMED IS:

- 1 1. A method which enables an user at a computer
2 terminal to access prepaid calling card accounts at
3 an account server, comprising the steps of:
4 (a) receiving, at the account server, a request for
5 access to a prepaid calling card account from
6 the computer terminal, the request indicating a
7 prepaid calling card number and transaction
8 information;
9 (b) evaluating the request at the account server,
10 the account server maintaining a balance for
11 each of one or more prepaid calling card
12 accounts; and
13 (c) transmitting a response to the computer terminal
14 indicating at least the balance of the prepaid
15 calling card account.
- 1 2. The method as recited in claim 1, wherein the account
2 server and the computer terminal are connected by a
3 computer network that includes the Internet.
- 1 3. The method as recited in claim 1, wherein:
2 the transaction information includes a request
3 to increase by an amount the balance of a prepaid
4 calling card account and a source to be charged for
5 the increase; and
6 step (b) comprises increasing the balance of the
7 prepaid calling card account and charging the source
8 for the amount.
- 1 4. The method as recited in claim 1, wherein:

2 the transaction information includes a request
3 for a refund of the balance of the prepaid calling
4 card account and a destination of the balance; and
5 step (b) comprises decreasing the account
6 balance and providing funds equal to the decrease to
7 the destination.

1 5. A method of charging a toll call to a prepaid calling
2 card account comprising:
3 (a) validating a request for a prepaid calling card
4 account, the request including billing
5 information and requester information;
6 (b) assigning, if the request is affirmatively
7 validated, the prepaid calling card account to a
8 billable telephone number;
9 (c) connecting the billable telephone number to a
10 remote called telephone number, the connection
11 being a toll call; and
12 (d) charging the prepaid calling card account
13 associated with the billable telephone number
14 automatically for the toll call initiated from
15 the billable telephone number.

1 6. The method of a toll call to a prepaid calling card
2 account as recited in claim 5 wherein:
3 step (b) comprises assigning a dialing access
4 code to the prepaid calling card account;
5 step (c) comprises evaluating the dialing access
6 code dialed with the called telephone number; and
7 step (d) comprises charging only the toll call
8 from the billable telephone number with the access

9 code to the prepaid calling card account associated
10 with the billable telephone number.

1 7. The method of charging a toll call to a prepaid
2 calling card account as recited in claim 5 wherein
3 step (c) comprises connecting the billable telephone
4 number to the called telephone number through a
5 computer network.

1 8. A prepaid calling card system comprising:
2 (a) a prepaid calling card account server maintaining
3 prepaid calling card account information and
4 being responsive to a request from a computer
5 terminal, wherein the request include current
6 account balance inquiries; and
7 (b) a telephone communication network including
8 telephones, billable telephone numbers assigned
9 to the telephones, and a telephone billing
10 system, the telephone billing system being
11 connected to the prepaid calling card account
12 server, wherein the prepaid calling card
13 accounts are assigned to billable telephone
14 numbers.

1 9. A prepaid calling card account system comprising:
2 (a) a receiving means for receiving requests for access
3 to a prepaid calling card account;
4 (b) an evaluation means for evaluating the request for
5 access to the prepaid calling card account, the
6 evaluation means being connected to a prepaid
7 calling card billing means; and

- 8 (c) a transmission means for transmitting the results
9 of the evaluation means to a computer terminal.

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FIG. 1

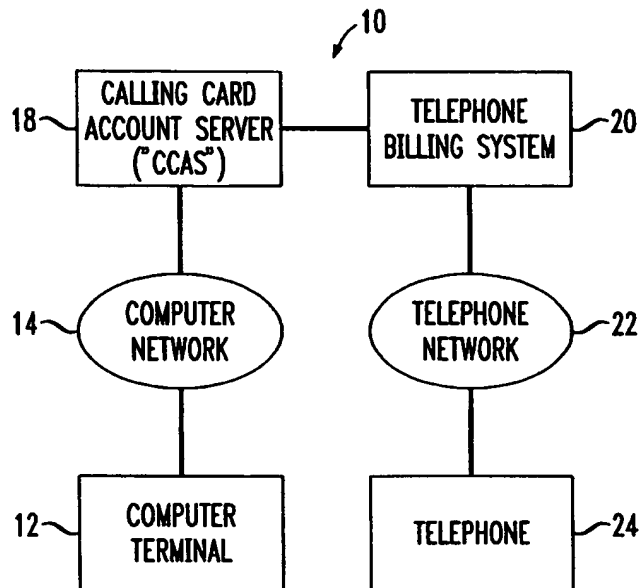
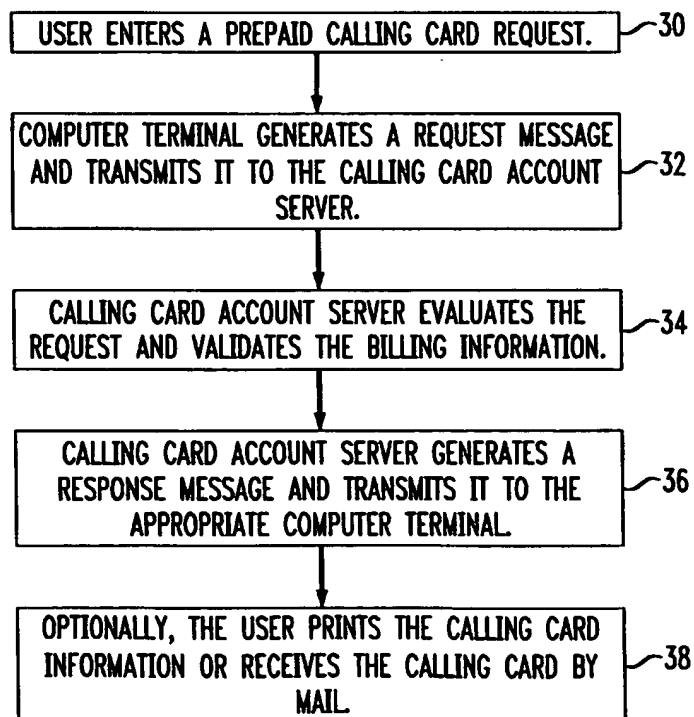


FIG. 2



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FIG. 3

